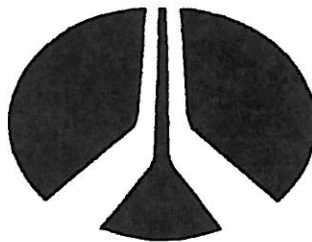


# Interim Status Closure Plan Solid Waste Management Unit 60

For U.S. D.O.E. -Rocky Flats Plant  
Transuranic Mixed Wastes

CO7890010526

1 April 1989



Rockwell International

**Not For Public Dissemination**

May contain unclassified controlled nuclear information  
subject to section 148 of the Atomic Energy Act of 1954,  
as amended (42 USC 2158)

Approval by the Department of Energy prior to release is required

Reviewed for Classification/UCNI/OUO  
By: Janet Nesheim, Derivative Classifier  
DOE, EMCBC  
Date: 10-28-08  
Confirmed Unclassified, Not UCNI/Not OUO

*Previously determined to be Not UCNI*

Reviewed for Classification  
by Barbara Kerr Greer  
Date, April 1, 1989 -UNCL-

**REVIEWED FOR CLASSIFICATION/UCNI**

By [Signature]  
Date 4/21/92

CORRES CONTROL  
OUTGOING LTR NO

89 RF 1143

Rocky Flats Plant  
Aerospace Operations  
Rockwell International Corporation  
P O Box 464  
Golden Colorado 80402-0464  
(303) 966-7000



Rockwell  
International

Contractor to U S Department of Energy

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ANNON W M		
AITH R E		
STON W F		
OZMAK B D		
JUNG E R		

March 30, 1989

89-RF-1143

Albert E. Whiteman  
Area Manager  
DOE, RFAO

CLOSURE PLANS FOR UNITS 53 AND 60

Attn. K. J. Schneider

Please find enclosed six copies each of the above referenced closure plans. These closure plans meet the DOE/Rockwell commitments to the Colorado Department of Health (CDH) to submit closure plans for Units 53 and 60 by April 1, 1989.

Both these units were identified in the RCRA Part B Permit Application for Transuranic (TRU) Mixed Wastes. The closure plan for Unit 53 does not include Room 3305, as originally identified in the Part B Permit Application, as no TRU waste cementation treatment operations were ever conducted there.

Should you have any additional questions please contact Michael Arndt at extension 4294.

*TC*  
K. B McKinley  
RCRA/CERCLA Program

Orig. and 1 cc - A. E. Whiteman  
Enc.

Reviewed for Classification/UCNI/OUO  
By: Janet Nesheim, Derivative Classifier  
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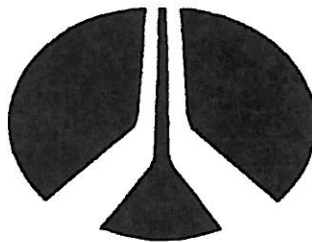
F 45469 (Rev 9/88)

# Interim Status Closure Plan Solid Waste Management Unit 60

For U.S. D.O.E. -Rocky Flats Plant  
Transuranic Mixed Wastes

CO7890010526

1 April 1989



Rockwell International

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Date: 10-28-08  
Confirmed Unclassified, Not UCNI/Not OUO

*Previously determined to be Not UCNI*

Reviewed for Classification  
by Barbara Kerr Greer  
Date, April 1, 1989 -UNCL-

**REVIEWED FOR CLASSIFICATION/UCNI**

By [Signature]  
Date 4/21/92

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CO7890010526

REGULATORY CHECKLIST FOR UNIT 60 DRUM STORAGE AREA

6 CCR 1007-3 PART/REQUIREMENT	[40 CFR] [SECTION]	CLOSURE PLAN SECTION
----------------------------------	-----------------------	-------------------------

<u>Closure Performance Standard</u> 265.111	[265.111]	3.1
--	-----------	-----

The owner or operator must close his facility in a manner that:

- a. Minimizes the need for further maintenance; and
- b. Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface water or to the atmosphere; and
- c. Complies with the closure requirements of this Subpart including, but not limited to the requirements of Sections 265.197, 265.228, 265.258, 265.280, 265.310, 265.351, 265.381, and 265.404.

Detailed Description of Steps Necessary to Close the Storage Facility:  
265.112(b)1 [265.112(b)1]

Content of Plan. The plan must identify the steps necessary to perform partial and/or final closure of the facility at any point during its active life. The closure plan must include, at least:

- 1. A description of how each hazardous waste management unit at the facility will be closed in accordance with Section 265.111; and

3.2, 4.0 5.0,  
6.0, 7.0



Identification of Maximum Extent of Operation of the Storage Facility:

265.112(b)2 [265.112(b)2] 2.2

2. A description of how final closure of the facility will be conducted in accordance with Section 265.111. The description must identify the maximum extent of the operations which will be unclosed during the active life of the facility; and

Removal and Management of Hazardous Wastes:

Estimate of Maximum Inventory of Hazardous Waste in the Storage Facility:

265.112(b)3 [265.112(b)3] 2.2.2

3. An estimate of the maximum inventory of hazardous wastes ever on-site over the active life of the facility and a detailed description of the methods to be used during partial closures and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or disposing of all hazardous wastes, and identification of the types(s) of the off-site hazardous waste management units to be used, if applicable; and

Detailed Description of Removal of Hazardous Waste Inventory:

265.112(b)3 [265.112(b)3] 4.0

265.114 [265.114] 4.0

When closure is completed, all facility equipment and structures must have been properly disposed of, or decontaminated by removing all hazardous waste and residues.

Identification and Type of Off-Site Hazardous Waste Management Unit(s):

265.112(b)3 [265.112(b)3] 5.0

Decontamination and Removal of Hazardous Waste Residues:

Criteria for Determining the Extent of Decontamination Necessary:  
265.112(b)4 [265.112(b)4]

6.1

A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination necessary to satisfy the closure performance standard;

Detailed Description of Decontamination Steps:

265.112(b)4 [265.112(b)4]

6.0

Procedures for Cleaning Equipment and Structures and Removing Contaminated Soils, and Detailed Description of Decontamination:

265.112(b)4 [265.112(b)4]

6.0

265.114

[265.114]

A Detailed Description of Removal of Contaminated Equipment and Hazardous Waste Residues:

265.112(b)4 [265.112(b)4]

6.3, 6.4, 6.6

265.114

[265.114]

Methods for Sampling and Testing to Demonstrate Success of Decontamination:

265.112(b)4 [265.112(b)4]

7.0

265.114

[265.114]

Detailed Closure Schedule:

265.112(b)6

[265.112(b)6]

8.0

A schedule for closure of each hazardous waste management unit and for final closure of the facility. The schedule must include, at a minimum, the total time required to close each hazardous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all hazardous waste inventory and of the time required to place a final cover must be included.);

Time Allowed for Closure:

265.113b

[265.113b]

8.0

The owner or operator must complete closure activities in accordance with the approved closure plan and within 180 days after receiving the final volume of wastes or 180 days after approval of the closure plan, if that is later. The Department may approve a longer closure period using the procedures under 265.112(c) if the owner or operator demonstrates that;

- 1.i. The closure activities will, of necessity, take him longer than 180 days to complete;
  - ii.A. The facility has the capacity to receive additional waste;
  - B. There is a reasonable likelihood that a person other than the owner or operator will recommence operation of the site;
  - C. Closure of the facility would be incompatible with continued operation of the site; and
2. He has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but inactive facility.

Certification of Closure:

265.115

[265.115]

13.0

Certification of Closure. When closure is completed, the owner or operator must submit to the Department certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

Closure Cost Estimates, Financial Assurance and Liability Coverage:

266.12

[265.142]

9.0

- a. The owner or operator must prepare a written estimate, in current dollars, of the cost of closing the facility in accordance with the closure plan as specified in 264.112. The closure cost estimates must equal the cost of closure at the point in the facility's operating life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan.
- b. During the operating life of the facility, the owner or operator must adjust annually the closure cost estimates. The adjustment must be made using an inflation factor derived from the annual Implicit Price Deflator for Gross National Product as published by the U.S. Department of Commerce in its Survey of Current Business. The inflation factor is the result of dividing the latest published annual deflator by the deflator for the previous year. Adjustments to the cost estimates are made by multiplying the latest closure cost estimate by the latest inflation factor. Facilities using a financial mechanism other than the financial test or corporate guarantee should use the deflator published close to the anniversary date of the instrument. Facilities using the financial test or corporate guarantee should use the deflator published nearest the fiscal year end reporting date required by 266.14(i)5. The adjust closure cost (ACC) estimate is calculated as follows:

6 CCR 1007-3

PART/REQUIREMENT

[40 CFR]  
[SECTION]

CLOSURE PLAN  
SECTION

ACC=CCC x IF

ACC= Adjusted closure cost,

CCC= Current closure cost estimate as determined in paragraph (a) above.

IF = Inflation factor =  $LPD/PYD$

LPD= Latest published Deflator

PYD= Previous year's Deflator

c. The owner or operator must revise the closure cost estimate whenever a change in the closure plan increases the cost of closure. The revised closure cost estimate must be adjusted for inflation as specified in 266.12(b)

x

d. The owner or operator must keep the following at the facility during the operating life of the facility: The latest closure cost estimate prepared in accordance with 255.12(a) and (c) and, when this estimate has been adjusted in accordance with 266.23(b), the latest adjusted closure cost estimate.

**INTERIM STATUS CLOSURE PLAN FOR  
SOLID WASTE MANAGEMENT UNIT NO. 60,  
BUILDING 371, ROOM 1208**

**1.0 INTRODUCTION**

**1.1 Plant Location and Mission**

The U.S. Department of Energy's Rocky Flats Plant is located in north-central Colorado, northwest of the City of Denver (Figure 1). The Plant is located in Sections 1 through 4 and 9 through 15 of T.1 S., R. 70 W. The facility's EPA identification number is CO 7890010526. The mailing address is:

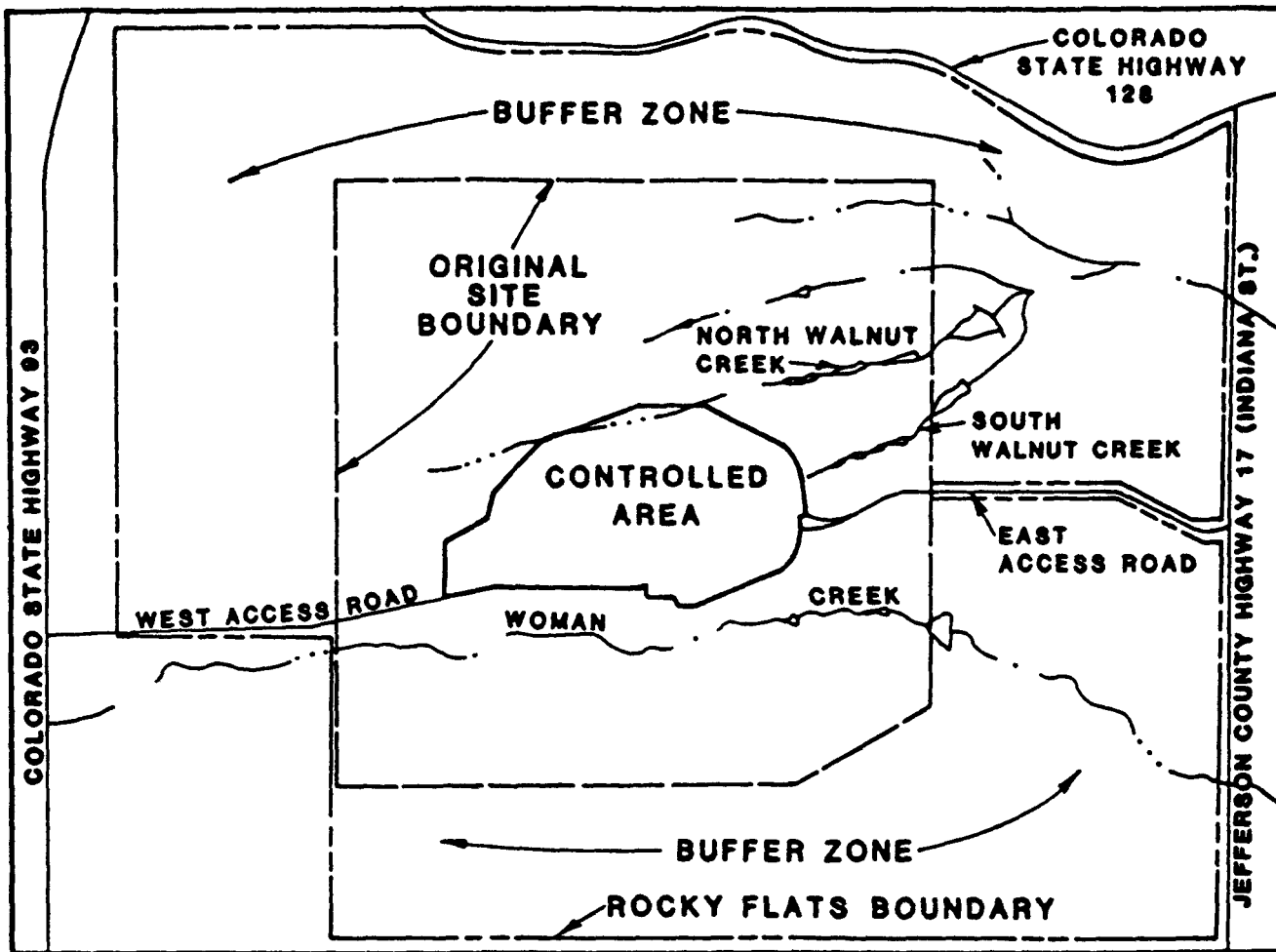
U.S. Department of Energy  
Rocky Flats Plant  
P.O. Box 928  
Golden, CO 80402

The facility contact is:

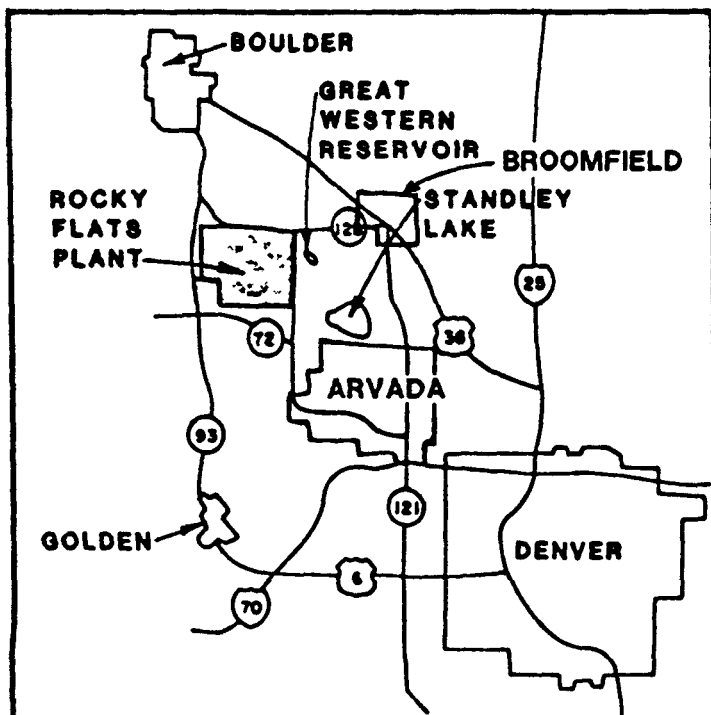
Mr. Albert E. Whiteman, Area Manager  
Phone: 303-966-2025

Rockwell International is the prime operating contractor for Rocky Flats Plant (since June 1975) under the general direction of the U.S. Department of Energy (DOE), Albuquerque Operations Office. As a government-owned and contractor-operated facility, the Rocky Flats Plant comprises a portion of the nationwide nuclear weapons production complex.

The primary Plant mission is to produce plutonium components for nuclear weapons. Plutonium, uranium, beryllium, and stainless steel parts are fabricated at the Plant and shipped off-site for final




APPROXIMATE SCALE 1"=3,300'



APPROXIMATE SCALE 1"=40,000'



VICINITY MAP



UNIT 60  
INTERIM STATUS CLOSURE PLAN  
ROCKY FLATS PLANT  
GOLDEN, COLORADO

**FIGURE 1**

assembly. Additional activities include chemical processing to recover plutonium from scrap material, metallurgical research and development, machining, assembly, non-destructive testing, coatings, remote engineering, chemistry, and physics. Waste handling operations at the Rocky Flats Plant include storage, transport, treatment, and packaging of waste materials generated on-site. The waste forms that are handled include hazardous chemical waste, transuranic (TRU) waste, non-hazardous, non-radioactive waste, and combinations thereof. Specifically, this Interim Status Closure Plan addresses containerized storage of TRU mixed waste.

## 1.2 Interim Status Closure Plan Purpose

Submittal of a closure plan is required to delete facilities from the Resource Conservation and Recovery Act (RCRA) Part B Permit Application. As a portion of the RCRA Compliance activities at the Rocky Flats Plant, closure plans are appended to the Post-Closure Care Permit.

The intent of this plan is to provide for closure of Building 371, Room 1208, solid waste management unit (SWMU) No. 60 in compliance with Part 265 closure regulations and in accordance with the Compliance Agreement entered into by the U.S. Environmental Protection Agency (EPA), DOE, and Colorado Department of Health (CDH). This plan addresses Colorado Hazardous Waste Regulations under CHWR 265, Subpart G, Closure and Post-Closure; Section 265, Subpart I, Use and Management of Containers; and equivalent Federal regulations.



## 2.0 FACILITY DESCRIPTION

### 2.1 Facility Location and Specifications

Building 371 is located in the northwest portion of the controlled area (Figure 2). Room 1208, which provides solid waste drum storage for cementation activities which were conducted in Building 371, is located inside a fenced area in the sub-basement of Building 371. The floor is approximately 30 feet below grade, and the ceiling is 15 feet 8 inches high. The area is irregularly shaped, measuring approximately 8 feet 9 inches by 54 feet 8 inches. The floor is constructed of concrete sealed with epoxy paint, and all walls consist of concrete or cinder block sealed with epoxy paint. A site map showing the layout of Room 1208 is provided in Figure 3.

### 2.2 Facility Operation

#### 2.2.1 Periods of Operation

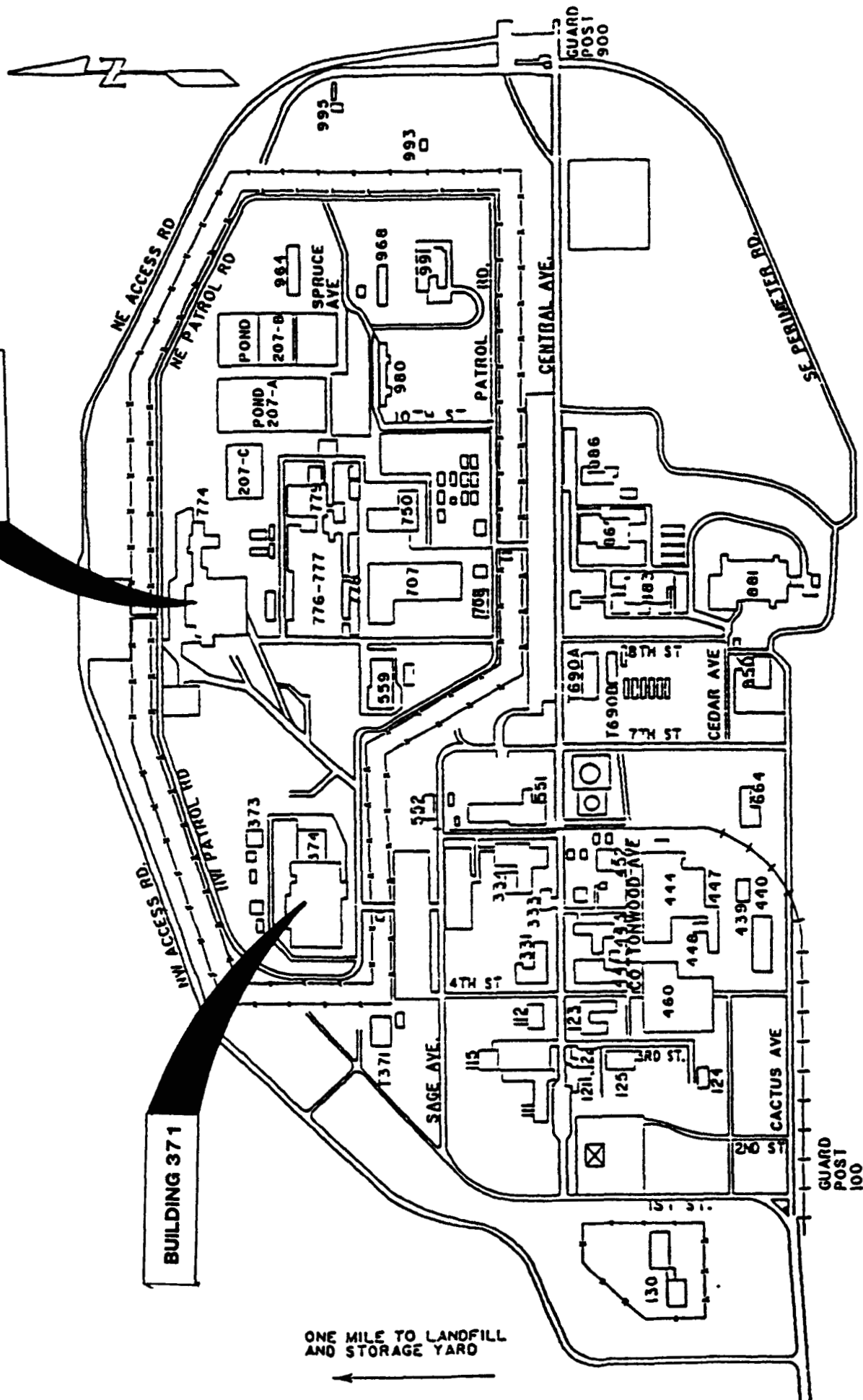
The revised June 7, 1988 Part A requested approval to store waste in Unit 60, a small storage area located in Building 371. This unit was originally intended to store wastes awaiting cementation in Unit 53 (Building 371). Waste was first received in April/May 1988, and was first stored over 90 days in the unit in July 1988. All waste was removed from the storage area by January 16, 1989.

#### 2.2.2 Maximum Waste Inventory

The maximum waste storage capacity of Room 1208 in Building 371 is 178 steel drums of 55-gallons each, or 9,790 gallons of solid waste. The maximum quantity of waste stored in Unit 60, Building 371 was 100 steel drums of 55 gallons each, or 5,500 gallons of solid waste.

BUILDING 771

BUILDING 371

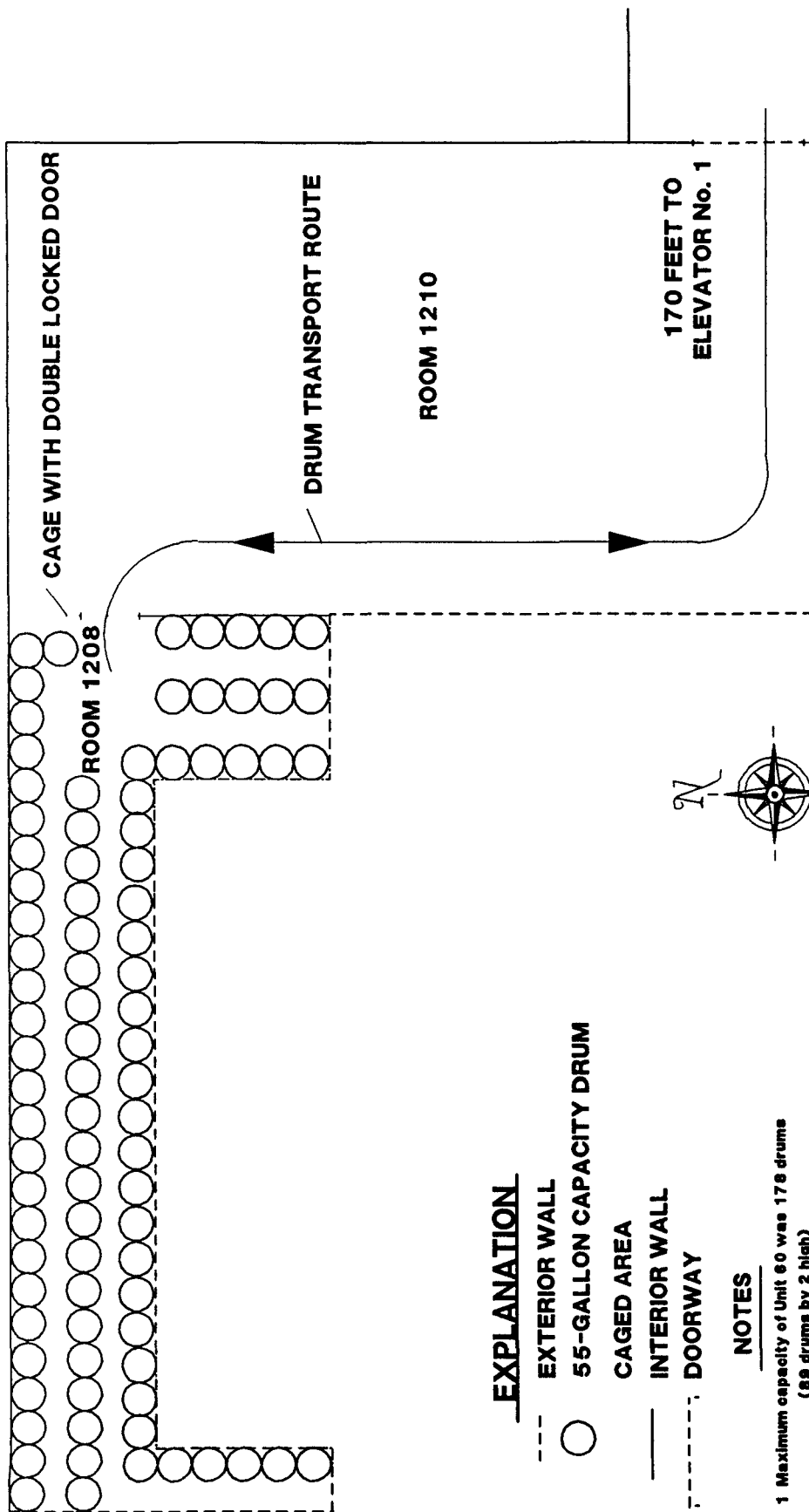


ONE MILE TO LANDFILL  
AND STORAGE YARD



UNIT 60  
INTERIM STATUS CLOSURE PLAN  
ROCKY FLATS PLANT  
GOLDEN, COLORADO  
FIGURE 2

ROCKY FLATS PLANT CONTROLLED AREA



# EXPLANATION

- EXTERIOR WALL
- 55-GALLON CAPACITY DRUM
- CAGED AREA
- INTERIOR WALL
- - - DOORWAY

## NOTES

- 1 Maximum capacity of Unit 60 was 178 drums (88 drums by 2 high)
- 2 Minimum aisle space between drums was 1-foot, 3-inches
- 3 All walls and floors are constructed of concrete or cinder block and have painted or epoxy finished surfaces
4. A minimum 2-inch high berm was constructed between Room 1208 and Room 1210

## **SITE PLAN** **UNIT 60, ROOM 1208, BUILDING 371**

### 2.2.3 Types of Waste Managed

Unit 60 was used to store TRU mixed solid wastes, including incinerator ash and sludge, ion exchange resin, and filter sludge. Table 1 identifies the wastes approved for treatment in Unit 53 (Building 371) and stored in Unit 60, along with corresponding EPA Hazardous Waste Numbers and item description codes (IDCs). The IDC identifies the physical and chemical form of the TRU material in process, and is used to account for materials throughout the Plant. TRU mixed wastes are defined as hazardous wastes exhibiting alpha activity greater than 100 nanocuries per gram and having radionuclides with atomic numbers higher than uranium. The following maximum concentrations of hazardous constituents were estimated to occur in TRU mixed wastes stored in Unit 60 based on process knowledge:

o	1,1,1-Trichloroethane	-	200 ppm
o	Carbon Tetrachloride	-	25 ppm
o	1,1,2-Trichloro- 1,2,2-Trifluoroethane	-	200 ppm
o	Methylene Chloride	-	100 ppm
o	Methyl Alcohol	-	15 ppm
o	Xylene	-	50 ppm
o	Butyl Alcohol	-	10 ppm
o	Lead	-	400 ppm

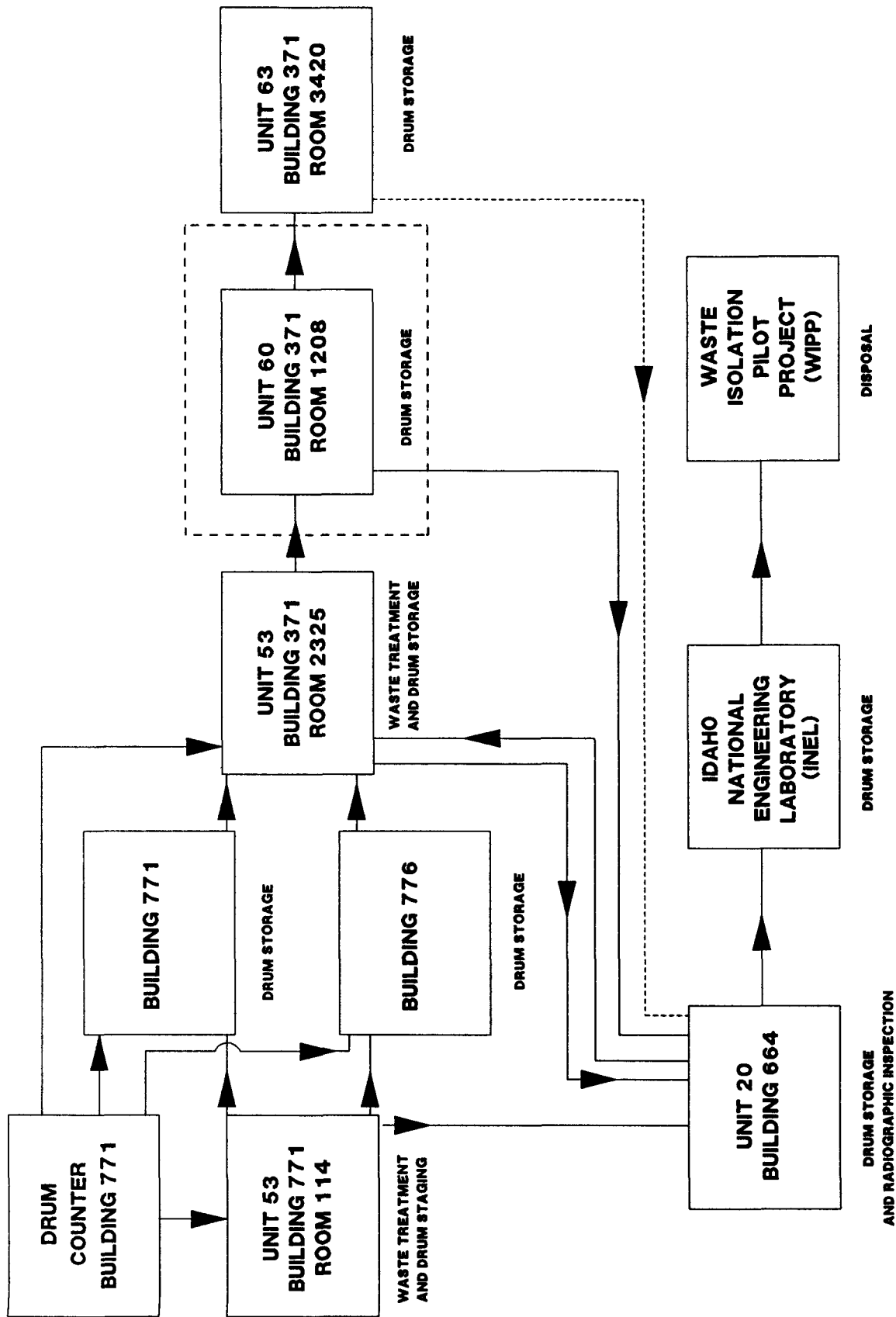
### 2.2.4 Waste Process Description

Figure 4 shows the waste handling, treatment, storage and disposal process of the TRU mixed wastes during the last 19 years. Between approximately 1970 and spring of 1985, wastes underwent treatment/cementation and containerization in Glovebox No. 2 in Unit 53, Room 114, Building 771. In January of 1986, the cementation process began in Unit 53, Room 2325, Building 371, and

**TABLE 1**

**WASTES APPROVED FOR TREATMENT IN UNIT 53  
AND STORED IN UNIT 60**

<b>ITEM</b>		
<b>DESCRIPTION</b>		
<b>CODE</b>	<b>DESCRIPTION</b>	<b>EPA HAZARDOUS WASTE NUMBER</b>
311	Graphite Heels and Fines	None
372	Grit	None
373	Firebrick Heels and Fines	D004, D006, D007
378	Firebrick, pulverized	D004, D006, D007
393	Sand, Slag and Crucible Heels	None
420	Incinerator Ash	F001, F002, F003
421	Ash Heel	D004, D006, D007
423	Soot and Soot Heels	D002, D006, D007
430	Ion Exchange Resin	D002, F001, F002
431	Ion Exchange Resin	D002, F001, F002



# CONTAINERIZATION, STORAGE, STABILIZATION, AND DISPOSAL PROCESS

continued until April 1987, when the operation ceased. Cemented wastes from both units were transported to Unit 20, Building 664, where Real-time Radiography inspections were performed to confirm that drums did not contain free liquids. Drummed wastes were then shipped to the Idaho National Engineering Laboratory (INEL) for storage, awaiting eventual disposal at the Waste Isolation Pilot Project (WIPP) in New Mexico. No cementation is currently being conducted at the Plant, and none was conducted between spring of 1985 and January 1986.

During the period of time between the end of cementation operations in Building 771 and the beginning of operations in Building 371, wastes awaiting cementation were accumulated and stored in the following locations:

- o Building 771
- o Building 776
- o Building 371
- o Building 664

Upon initiation of cementation operations in Building 371, the backlog of drums stored in the above locations was gradually removed.

Building 371, Room 2325, was used for storage of the waste awaiting cementation during the period from January 1987 until April/May of 1988. The drums that had been stored in Building 371, Room 2325, and the drums of waste awaiting future cementation, were moved to Building 371 Room 1208, Unit 60, and from there moved to Building 371, Room 3420, Permitted RCRA Storage Area No. 63.

No waste treatment has occurred in Unit 60. Room 1208 of Building 371 was used for storage of TRU mixed wastes awaiting cementation in Unit 53. The drums that were stored in Unit 60 were previously

stored in Room 2325 of Building 371, and were moved to Room 1208 in April/May 1988. These drums were transported by forklift and drum dolly from Elevator No. 1 down a 10-foot wide, 170-foot long hallway, then through Room 1210 and into Room 1208, where they were arranged and stacked two high for storage. Figure 3 shows the route of drum transport into Room 1208. By January 16, 1989, all drums were moved by drum dolly, elevator, and forklift from Room 1208 to Room 3420 of Building 371, Permitted RCRA Storage Area Unit 63.

#### 2.2.5 Monitoring and Containment Systems

The floor of Room 1208 is constructed of concrete sealed with epoxy paint. A minimum 2-inch high berm was constructed between Rooms 1210 and 1208. All steel drums were stored on pallets, which provided protection from accumulated liquids. Aisle space (minimum 1-foot 3-inches) was maintained to allow access for periodic container inspections and emergency equipment. These inspections were conducted weekly, and consisted of visually assessing the structural integrity of the drums and checking for leaks or corrosion.

#### 2.2.6 Releases

No known releases have occurred from the drums of waste associated with TRU cementation which were stored in Unit 60. Any radioactive and/or hazardous releases identified from the unit would have been cleaned up according to standard methodologies (Rockwell International, 1979).



### 3.0 INTERIM STATUS CLOSURE PLAN SUMMARY

#### 3.1 Closure Objectives

This interim status closure plan has been prepared to meet the performance standards of 6 CCR 1007-3, Section 265.111. The promulgated standards require a facility be closed in a manner that:

- o Minimizes the need for further maintenance; and
- o Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or to the atmosphere.

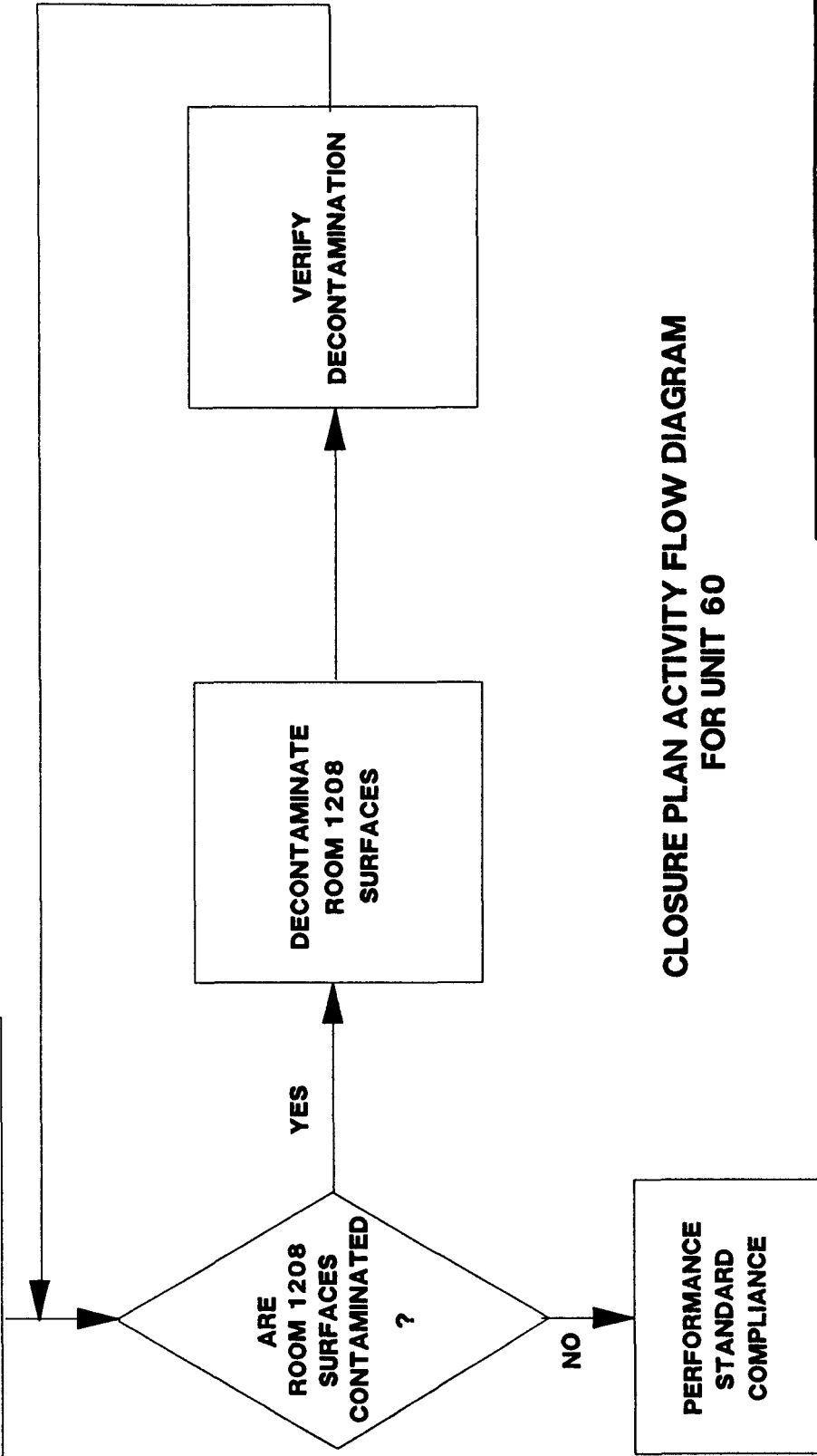
#### 3.2 Interim Status Closure Plan

The progression of activities necessary to complete closure is shown in Figure 5. Principal activities include:

- o Characterization of contamination in Room 1208 to determine the extent of decontamination required
- o Decontamination of surfaces in Room 1208 (if required)
- o Decontamination verification (if required)
- o Performance standard compliance

It is believed that compliance with the performance standards can be currently achieved at Unit 60. As shown in Figure 5, the results of testing the concrete floor to characterize the magnitude and extent of contamination will determine whether or not decontamination procedures are required. If decontamination is

PERFORM CONTAMINATION  
CHARACTERIZATION TESTING  
OF ROOM 1208 SURFACES



CLOSURE PLAN ACTIVITY FLOW DIAGRAM  
FOR UNIT 60



UNIT 60  
INTERIM STATUS CLOSURE PLAN  
ROCKY FLATS PLANT  
GOLDEN, COLORADO

FIGURE 5

determined to be impracticable, then an amended closure plan will be submitted within 30 days of this unexpected event.

Because of the presence of monitoring and containment features such as the epoxy-sealed concrete floor, berms, and routine inspections, there are believed to be no contaminated soils resulting from storage of TRU mixed waste at Unit 60. There is no auxiliary equipment requiring disposal or decontamination, and the hazardous waste inventory stored on-site has been previously removed.

### 3.3 Closure Schedule

The CDH and the EPA Regional Administrator will be notified of the intent to close Unit 60, 45 days prior to beginning the closure. Decontamination of the unit will be accomplished within 90 days from the beginning of closure. The decontamination of equipment will require 10 additional days. An additional 90 days will be required prior to receipt of analytical results.

Assuming the unit is shown to be sufficiently clean after one decontamination, closure will be certified 180 days after closure plan approval. If the analysis of the final rinse solution indicates contamination is still present above the performance standards, the closure schedule will be revised within 30 days of this finding.

### 3.4 Administration of Interim Status Closure Plan

The interim status closure plan for the Unit 60 Drum Storage Area will be maintained at the Rocky Flats Area Office, Building 115, U.S. Department of Energy. The person responsible for storing and updating this copy of the closure plan is:

Mr. Albert E. Whiteman, Area Manager  
U.S. Department of Energy  
Rocky Flats Plant  
P.O. Box 928  
Golden, Colorado 80402  
Phone: (303) 966-2025

#### 4.0 REMOVAL OF HAZARDOUS WASTE INVENTORY

As of January 16, 1989, all TRU mixed waste was removed from Unit 60 and stored in Unit 63, a permitted RCRA storage area. Unit 60 currently contains no hazardous waste inventory requiring removal.

#### 5.0 OFF-SITE WASTE MANAGEMENT

The only TRU waste residues requiring disposal will be rinsate from possible decontamination activities. It is anticipated that the small quantity of rinsate generated can be disposed on-site at the Building 374 treatment facility. Currently, there is no authorized off-site waste management facility available in which to dispose of contaminated equipment used during decontamination activities. It is assumed that such a site will be available at the time of closure; however, pertinent details of the facility's location and operations are presently unknown.

#### 6.0 DECONTAMINATION

##### 6.1 Performance Criteria

Decontamination of Room 1208 and all ancillary items and cleaning equipment will be conducted such that residual levels of hazardous constituents are found to be less than or equal to ten times the suggested-no-adverse-response-levels (SNARL). The following

hazardous waste constituents known to have occurred in the stored drums will serve as indicator parameters:

<u>Parameter</u>	<u>10 X SNARL</u>
1,1,1-Trichloroethane	2 mg/l
Carbon Tetrachloride	0.71 mg/l
Methylene Chloride	3.5 mg/l
Xylene	4.4 mg/l

The remaining hazardous waste constituents listed in Section 2.2.3 (methyl alcohol, butyl alcohol and lead) were not selected as indicator parameters due to their possible existence in the decontamination solvents and unit construction materials. In addition, 1,1,2-trichloro-1,2,2-trifluoroethane was not selected as an indicator parameter because no standard EPA method exists for analysis.

The SNARL (EPA, various dates) concentrations were selected as appropriate hazardous constituent concentration because they were developed as water quality goals in an effort to protect human health and the environment. If the transport mechanism of the contaminant is expected to be through the hydrogeologic regime and the point of exposure is contact with these waters, the SNARL is an appropriate concentration for use as a basis for the performance standards associated with the solid or liquid sources which may be found at the facility undergoing closure. The above transport and exposure mechanism is the expected scenario.

The Extraction Procedure Toxicity concentrations are intended to provide an idea of the concentration of the leachate that would be generated due to a given waste matrix. There remains a question of what will happen to the leachate before it reaches the point of environmental exposure. To accommodate the attenuation in concentration that can be expected to occur as the waste passes

through the soil beneath the waste matrix into the groundwater and ultimately to a drinking water source, the EPA (EPA, 1980) formulated a dilution factor designed to account for expected attenuation in the hydrogeologic regime. This attenuation factor was based on the following assumptions:

- o The waste is situated over an aquifer that is a source of drinking water;
- o The soil below the facility is composed of material with limited attenuative capacity; and
- o Persons using the aquifer as a source of drinking water are supplied from a well situated 500 feet downgradient from the waste matrix.

On the basis of the information presented above, the EPA selected an attenuation factor of 100 as a revision to their original selection of an attenuation factor of 10.

Working in an upgradient direction from the receptor to the source, the SNARL concentrations may be multiplied by a factor of 100 to determine the closure performance standard. However, adopting a conservative approach, an attenuation factor of 10 was used to establish performance standards for the decontamination activities associated with closure of this unit.

With respect to radioactive contamination, the levels of fixed and removable activity will determine if cleaning/recleaning is required, or if the unit can be used in its current condition. Decontamination will be considered complete when:

- o The direct count does not exceed 1000 disintegrations per minute (dpm) per 100 cm<sup>2</sup> of total alpha activity as measured with an air proportional alpha survey instrument, and

- o The removable alpha activity does not exceed 20 dpm per 100 cm<sup>2</sup>, as measured from smears with filter paper counted on a scintillation instrument.

## 6.2 Decontamination of Room 1208

Prior to initiation of decontamination procedures, surface wipe sampling will be performed on the surfaces of Room 1208 to determine if sufficient contamination exists to necessitate decontamination activities. Sampling/testing will be conducted using EPA-approved procedures and minimum detection levels. Testing for hazardous materials will involve measuring the concentrations of the indicator parameters identified in Section 6.1. A wipe sample which has not been used to sample the surfaces of the unit will be analyzed for those hazardous constituents listed in Section 6.1, and these results will be considered as background levels. Those wipe samples used to sample the surfaces of the unit will also be analyzed for those hazardous constituents listed in Section 6.1, and the difference in concentrations between these two results will be compared to the performance standards listed in Section 6.1. Should the adjusted sample concentrations exceed the performance standards, the decontamination measures listed below will be initiated.

To characterize the contamination of radioactive substances, measurements will be taken to determine levels of fixed and removable radioactivity. Total alpha activity levels of the unit will be measured with an air-proportional-type alpha survey meter. Smears will be taken and counted according to plant procedures to determine the level of removable activity. The levels of total and removable alpha activity will determine if the unit requires cleaning, or if it can be used in its current condition.

If wipe sampling indicates decontamination is required, the surfaces in Room 1208 will be cleaned by one of several commonly implemented methods, including hydroblasting/water wash or foam cleaning. A triple wash/rinse cycle will be utilized using "SOLNI", or an equivalent available solution. This solution is effective in removing TRU mixed wastes. The cleaning solutions, wash, and rinsate will be collected by a vacuum unit.

Prior to initiation of decontamination activities, a "rinsate" sample will be collected for analysis of those hazardous parameters listed in Section 6.1, and these results will be considered as background levels. Following the decontamination efforts, "rinsate" samples will be collected and analyzed for those hazardous constituents listed in Section 6.1, and the difference in concentration between these two results will be compared to the performance standards listed in Section 6.1. The unit will be judged to meet the performance standards if the adjusted concentration of the "rinsate" is below the performance standard concentrations.

### 6.3 Decontamination of Auxiliary Equipment

There is no currently identifiable auxiliary equipment which was used at the Unit 60 drum storage area.

### 6.4 Decontamination of Equipment Used During Closure

Upon completion of each phase of decontamination required for closure, equipment will be decontaminated by steam cleaning at a designated washdown area located in the room before being sent to another decontamination site or before leaving the plant site. Decontamination will include:



1. A rinse with a steam cleaner using water free of volatile organics.
2. Scrubbing with brushes using a solution of water with Liquinox detergent that is free of volatile organics.
3. A final rinse with the steam cleaner using water free of volatile organics.

Rinsate will be collected in approved containers and will be treated on-site at Building 374. Plastic sheets used in the decontamination area and all other disposable contaminated equipment accumulated during closure will be containerized and shipped to an authorized off-site disposal facility.

#### 6.5 Contaminated Soils

Due to the containment features of the storage facility described in Section 2.2.5, there has been no known contamination of area soils as a result of drum storage in Unit 60.

#### 6.6 Removal of Hazardous Waste Residues

Approximately 280 gallons of waste may be generated by decontamination processes. The waste will be collected and placed in 55-gallon drums or a tank truck. The effluent contained in the drums or tank truck will be transferred to Building 374 for treatment.

### 7.0 DECONTAMINATION VERIFICATION

#### 7.1 Sampling Procedures

The success of decontamination procedures for hazardous materials will be measured by comparing the adjusted concentration of appropriate substances in rinsate with the performance standards

listed in Section 6.1. Testing will be conducted using EPA-approved procedures and minimum detection levels.

In verification tests, a "rinsate" sample will be collected for analysis of those hazardous parameters listed in Section 6.1, and these results will be considered as background levels. Following the decontamination efforts, "rinsate" samples will be collected and analyzed for those hazardous constituents listed in Section 6.1, and the difference in concentration between these two results will be compared to the performance standards listed in Section 6.1.

The unit will be judged to meet the performance standards if the adjusted concentration of the "rinsate" is below the performance standard concentrations.

Decontamination rinsate sources will be grab-sampled after the preparation of the cleaning solution. A triple wash and rinse is expected to require less than 500 gallons of water, therefore only one sample of the rinsate source will be taken. One sample of the used wash and rinse water will be collected, and this sample will be taken as a grab sample from the third rinse solution after collection in the vacuum unit during the wash and rinse activities.

To verify the decontamination of radioactive substances, measurements will be taken to determine levels of fixed and removable radioactivity. Total alpha activity levels of the unit will be measured with an air-proportional-type alpha survey meter. Smears will be taken and counted according to plant procedures to determine the level of removable activity. The levels of total and removable activity will determine if the unit will be recleaned, or if the unit is sufficiently decontaminated. The unit will be considered clean if the direct count does not exceed 1000 dpm per

100 cm<sup>2</sup> of alpha activity, and the removable alpha activity does not exceed 20 dpm per 100 cm<sup>2</sup>.

## 7.2 Analytical Methods

The analytical methods to be used in evaluating the success of decontamination efforts, as documented in SW-846, are presented in Table 2 by indicator parameter. Radioactivity levels will be analyzed by using an air-proportional-type alpha survey meter (total alpha activity levels) and Smear activity measurements (removable activity).

## 8.0 CLOSURE SCHEDULE

The CDH and the EPA Regional Administrator will be notified of the intent to close Unit 60, 45 days prior to beginning the closure. Decontamination of the unit will be accomplished within 90 days from the beginning of closure. The decontamination of equipment will require 10 additional days. An additional 90 days will be required prior to receiving analytical results.

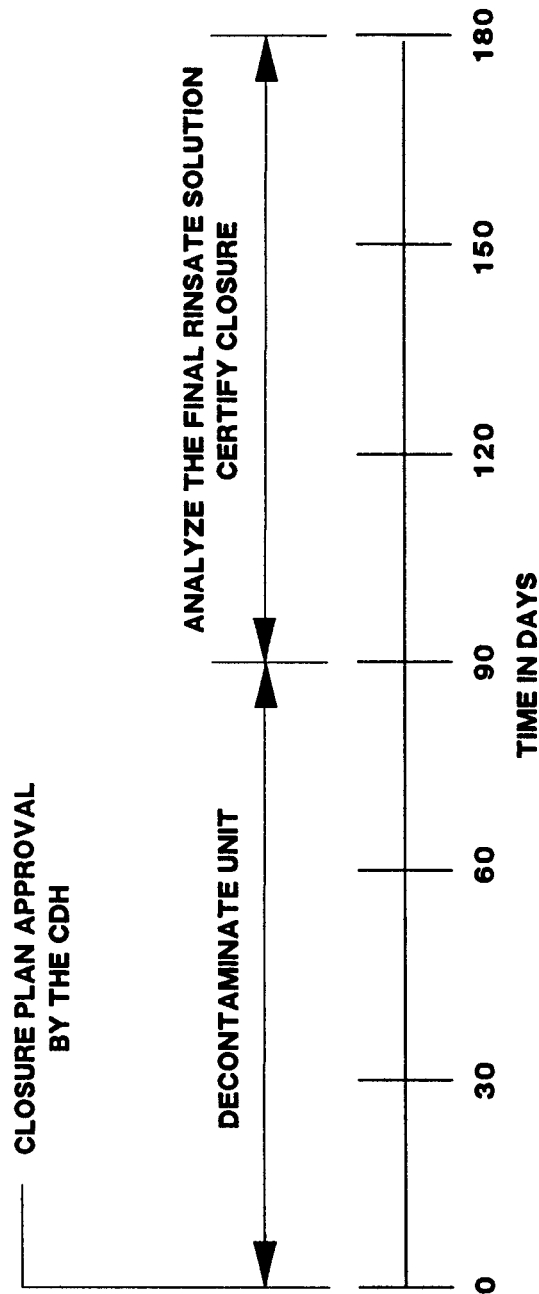
Assuming the unit is shown to be sufficiently clean after one decontamination, closure will be certified 180 days after closure plan approval (Figure 6). If the analysis of the final rinse solution indicates contamination is still present above the performance standards, the closure schedule will be extended to allow additional time for further decontamination and analysis.

Assuming that the unit is shown to be sufficiently clean after one decontamination effort, closure will be certified 180 days after closure plan approval.

**TABLE 2**

**ANALYTICAL METHODS FOR  
INDICATOR PARAMETERS**

<u>PARAMETER</u>	<u>ANALYSIS METHOD</u>	<u>DETECTION LIMIT</u>
1,1,1-Trichloroethane	624-GC/MS for Volatile Organics	5 µg/l
Carbon Tetrachloride	624-GC/MS for Volatile Organics	5 µg/l
Xylene	624-GC/MS for Volatile Organics	5 µg/l
Methylene Chloride	624-GC/MS for Volatile Organics	5 µg/l



## SCHEDULE OF CLOSURE ACTIVITIES



UNIT 60  
INTERIM STATUS CLOSURE PLAN  
ROCKY FLATS PLANT  
GOLDEN, COLORADO

FIGURE 6

## 9.0 CLOSURE COST AND FINANCIAL ASSURANCE

State and Federal governments are exempt from the financial requirements imposed by Subpart H of 6 CCR 1007-3, Section 265.140(c). Because the Rocky Flats Plant is a federally-owned facility, no cost estimates or financial assurance documentation is required. Cost estimates are presented in Table 3 for planning, budgeting and informational purposes. These estimates can in no way be considered binding.

The estimates presented in Table 3 are based on a worst case scenario in which the entire unit undergoing closure is found to be contaminated. These assumptions are expected to result in an overestimation of the actual costs that will be incurred, since this unit is expected to be clean.

## 10.0 SITE ACCESS AND SECURITY

Access to the work area will be limited to authorized personnel only. Exit from the working area will be through a clean, restricted area in the decontamination area. Existing security measures at the Rocky Flats Plant meet the requirements of 6 CCR 1007-3, Section 265.14. These include:

- o A three-strand barbed-wire cattle fence surrounding the facility posted to identify the land as a government reservation/restricted area,
- o A fence and armed guards posted 24 hours daily at two gates to the controlled area of the facility, and
- o Surveillance by security cameras 24 hours daily.

Existing fences and gates are operated and maintained by DOE. Maintenance requirements will be performed by DOE regardless of closure activities at the site.

**TABLE 3**

**COST ESTIMATE FOR CLOSURE OF UNIT 60**

Engineering Design and Inspection	\$ 7,500.00
Equipment	10,000.00
Decontamination Monitoring	7,500.00
Disposal	2,000.00
Contingency	<u>4,000.00</u>
<b>TOTAL</b>	<b>\$31,000.00</b>

## 11.0 HEALTH AND SAFETY

A site-specific Health and Safety Plan covering decontamination and closure of the site will be submitted to the CDH two months before closure activities begin. The plan will comply with all Occupational Safety and Health Administration (OSHA), CDH, EPA, and DOE requirements.

## 12.0 POST-CLOSURE MONITORING

The implementation of unit-specific post-closure monitoring is not expected to be necessary due to the contained nature of the drum storage area. However, monthly surface contamination surveys and gamma/neutron surveys will be conducted as part of routine radiological monitoring (Rockwell International, 1989a, 1989b).

## 13.0 CLOSURE CERTIFICATION

After completion of closure, the owner or operator and an independent certified registered engineer will submit certification of closure, based upon compliance with the closure plan, to the CDH and the EPA Regional Administrator.

The independent registered professional engineer will periodically review the closure operations in enough detail to assure final certification of closure. The final certification of closure will state that the closure procedures and standards have been carried out as described in the approved closure plan. In order to certify the performance and completion of closure activities, the independent registered professional engineer will review test results and inspect the site to verify the closure plan was carried out as approved. Both the operator and the independent registered professional engineer will submit a written document to the CDH and



the EPA Regional Administrator to certify closure activities were conducted in accordance with the approved closure plan.

#### 14.0 REFERENCES

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